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REMARKS/ARGUMENTS

Applicants assert that no new matter is presented by these amendments and respectfully request entry of the same. Upon entry of this amendment, claims 5-22 are pending, and of these, claims 5, and 22 are independent. No new claims have been added.

Claims 1-4, and 23-33 are cancelled in compliance with the restriction requirement mailed on December 13, 2002 and subsequent election by applicants of claims 5-22. Applicants reserve the right to re-present cancelled claims in a divisional, or other related application.

Claims 5, 10, 12, 14, 16, 19, and 22 are amended to remove unnecessary language. Applicants assert that the scope of each of the claims has not been changed as a result and upon entry of these amendments.

Claim 15 is amended to provide clarity with respect to the relationship between a reference plane and the axis of rotation that defines the reference plane. Applicants respectfully assert that the amendment does not narrow the scope of the claim and does not add new matter. Specifically, claim 15 is amended to claim a yaw reference plane that is perpendicular to the first axis in accordance with the terms meaning, as described below in response to a 35 U.S.C. 112 indefiniteness rejection for the use of the term "yaw".

Reply to Claim Rejections – 35 U.S.C. §112

The Examiner has rejected the use of the term "yaw" as being indefinite in claims 15, 20, and 21, asserting that the use of the term is contrary to the terms ordinary meaning

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and that the specification does not clearly redefine the term. The applicants respectfully disagree with the examiners assertion that the definition of the ordinary meaning of "yaw" is limited to "to turn about the vertical axis". Applicants assert that the ordinary meaning is broader and also includes a reference plane defined by rotation about an axis. Typically, the plane termed as "yaw" refers to a plane defined by rotation about the Z axis in a three dimensional coordinate system. The term is often used in the fields of physics with respect to aerodynamics (i.e. with respect to aircraft) as well as a variety of fields where three dimensional coordinate axes apply. Applicants respectfully present an example below:

"The orientation of an airplane (or any other object) can be specified by starting from a standard orientation and then applying some combination of yaw, pitch, and roll. The standard definitions of yaw, pitch, and roll are shown in figure 19.9. Note that we are visualizing rotations in terms of the plane of rotation as opposed to the axis of rotation.

In contrast, older books often speak in terms of the axis of rotation, as defined in figure 19.10. In the end, it comes to the same thing: for example, yaw-wise rotation is synonymous with a rotation about the Z axis.

Speaking in terms of the *plane of rotation* is more modern, more sophisticated, and more in accord with the way things look when you're in the cockpit: In normal flight, when the airplane yaws, you can see the nose moving in a horizontal plane"

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Found at the following address:

<http://www.av8n.com/how/htm/motion.html>

Applicants also respectfully point to the specification of the present application that sets forth the meaning of the term “yaw” that is in accordance with the terms ordinary meaning as described above, where for example the “yaw” direction defines a plane of rotation about the imagined central axis. Paragraph 0043 of the present application states:

“In accordance with one method of implementation, print head 140 may be registered against slide 206 by adjusting print head 140 in what will be referred to in the “yaw” direction. For example, print head 140 may be adjusted so that rings 250B-E aligns with edge 207 of slide 206. As shown in greater detail in Figures 3 and 4, this adjustment is made in the illustrated implementation by rotating head mounting plate 212 in a circular motion around an imagined central axis concentric with a central point of rings 250. The principal components of print head 140 of the present example that implement this circular motion are shown in Figure 3.”

Therefore, applicants respectfully assert that the use of the term “yaw” in claims 15, 20, and 21 is in accordance with the terms ordinary meaning as well as clearly being set forth in the specification and is thus not indefinite.

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The examiner has also rejected the use of the term "gantry" as being indefinite in claim 19, asserting that the use of the term is contrary to the terms ordinary meaning and that the specification does not clearly redefine the term. The applicants respectfully disagree with the examiners assertion that the ordinary meaning of "gantry" is limited to "a platform to support a crane". Applicants respectfully assert that the ordinary meaning is broader and also includes a "support framework for machinery" (Definition found at <http://encarta.msn.com/dictionary/gantry.html>).

Applicants also respectfully point to the description in the specification of the present application that sets forth the meaning of the term for instance including Gantry 120 in Figure 1, and further providing description of Gantry 120 as a supporting mechanism in accordance with the terms ordinary meaning. Paragraph 0032 of the present application states:

"During automated spotting in this illustrative implementation, print head 140 moves via gantry 120 over fixed platen 150 in a serpentine path from column to column. Gantry 120 of this implementation is a supporting mechanism that includes a screw drive on the X axis, i.e. from column to column. The gantry supports print head 140 and moves via a rail or other conventional arrangement, with the rail typically being fixed in relation to the body of the instrument."

Therefore, applicants respectfully assert that the use of the term "gantry" in claim 19 is in accordance with the terms ordinary meaning as well as clearly being set forth in the specification and is thus not indefinite.

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Reply to Claim Rejections – 35 U.S.C. §102(b)

Claims 5-6, 10-12, and 22 are rejected under 35 USC 102(b) as being anticipated by Hayes et al. (US Patent Serial No. 5,658,802). The Examiner pointed to col. 1, lines 4-10; col. 4, lines 43-47; col. 4, lines 11-14; col. 4, line 59 to col. 5, line 8; col. 5, line 1-6; and col. 4, lines 48-58 for support of this rejection. Hayes et al. generally teaches an apparatus for dispensing small liquid droplets in predetermined patterns on a solid support and includes dispenser assemblies and a housing to house the dispenser assemblies. Additionally, the Examiner states that Hayes et al. discloses a first and a second position support system where the first position support system moves an apparatus for translation in one direction and the second position support system moves the apparatus for translation in two directions.

Also, claims 5-6, 10-13, and 22 are rejected under 35 USC 102(b) as being anticipated by Ackey et al. (US Patent 5,733,509). The Examiner pointed to col. 1, lines 7-9; col. 2, lines 30-39; col. 3, lines 35-49; col. 3, lines 5-10; col. 2, lines 9-15; and col. 4, lines 16-23 for support of this rejection. Ackey et al. generally teaches methods and systems for synthesizing an array of oligonucleotide probes on a substrate that includes employing a plurality of dispensing bars each for a respective nucleotide having a plurality of dispensing heads, where each of the dispensing bars are preferably fixedly positioned in an axis parallel to one another (Ackey et al. col.2, lines 40-48). The Examiner states that Ackey et al. discloses a positioning mechanism as well as a first and a second dispensing bar.

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Additionally, claims 5-22 are rejected under 35 USC 102(b) as being anticipated by Brown et al. (US Patent 5,807,522). The Examiner pointed to col. 1, lines 15-19; col. 3, lines 52-58; col. 9, lines 53-56; col. 4, lines 12-15; fig. ref #10; col. 7, lines 17-30; col. 3, lines 59-65; col. 10, lines 7-50; and fig. 4 ref #80, 82, 84, 86, 90, 92, 94, 96, and 98 for support of this rejection. Brown et al. generally teaches a method and apparatus for fabricating microarrays of biological samples for large scale screening assays. The Examiner states that Brown et al. discloses a structure that moves a dispenser toward and away from a support surface, and a positioning support that further includes a displacement assembly that moves the dispenser device along the x-axis and a structure that moves the dispenser along the y-axis.

Further, claim 22 is rejected under 35 USC 102(b) as being anticipated by Roach et al. (US Patent 5,770,151). The Examiner pointed to col.1, lines 5-9; figure 1, ref. #'s 10, 14, 16, and 18; and col. 3, line 54 for support of this rejection. Roach et al. generally teaches an improved liquid deposition device for automated deposition of biological molecules. The Examiner states that Roach et al. discloses a pod that facilitates movement of a capillary member in the Z direction, an arm that when associated with the pod facilitates movement in the X direction, and a cross member that when associated with the pod facilitates movement in the Y direction.

Applicants respectfully disagree with the examiners assertion that Hayes et al., Ackey et al., Brown et al., and Roach et al. teaches each of the claimed limitations of the aforementioned claims. In particular, applicants assert that none of the references teach the claimed limitation of the first mounting assembly of independent claims 5 and 22 such as, for instance, to enable movement of the deposit elements around a first axis.

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Similarly, applicants assert that none of the applied references teach the claimed limitation of the second mounting assembly such as to enable movement of the deposit elements around a second axis. Also, applicants assert that none of the references teach the claimed limitation of the third mounting assembly such as to enable movement around a third axis. In other words, none of the applied references describe rotational movement of elements around an axis, rather each of the applied references teaches linear movement of elements for printing operations. For example, the present application describes rotational movement for aligning deposit elements such as, for instance, yaw rotation as previously described with respect to the 35 USC 112 indefiniteness rejection, roll direction arrow 500 of Figure 5 that is further described in paragraph 0047, and pitch direction arrow 700 of Figure 7 that is further described in paragraph 0048, each setting forth the respective planes and axes of rotation. Thus, applicants assert that claims 5 and 22 are patentable.

With respect to dependant claims 6-21 each depend from claim 5 in the chain of dependency and thus include the limitations of the apparatus of claim 5. Therefore, claims 6-21 are patentable because none of the references described above teach all of the limitations of claim 5 as described above.

Reply to Claim Rejections – 35 U.S.C. §102(e)

Claim 5-12, and 14-22 are rejected under 35 USC 102(e) as being anticipated by Wang (US Patent 6,511,849 B1). The Examiner pointed to col.2, lines 2-3; figure 1, ref. #'s 14, 2, 3, and 4; col. 3, lines 24-65; figure 2, ref. #'s 9, and 8; col. 4, lines 4-16, and lines 53-67; and figure 3, ref. # 12 for support of this rejection. Wang generally teaches

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an apparatus and method for producing microarrays of biological materials. The Examiner states Wang discloses a first linear guide, a second linear guide, and a third linear guide, where the third linear guide is perpendicular to the first and second linear guides, and further where the first linear guide is perpendicular to the second linear guide.

Similar to the rejections made under 35 USC 102(b), applicants respectfully disagree with the examiners assertion that Wang teaches each of the claimed limitations of the aforementioned claims. In particular, applicants assert that Wang does not teach the claimed limitation of the first mounting assembly of independent claims 5 and 22 such as, for instance, to enable movement of the deposit elements around a first axis. Similarly, applicants assert that none of the applied references teach the claimed limitation of the second mounting assembly such as to enable movement of the deposit elements around a second axis. Also, applicants assert that none of the references teach the claimed limitation of the third mounting assembly such as to enable movement around a third axis. For example, Wang teaches the first, second, and third linear guides. As with the rejections made under 35 USC 102(b), Wang similarly does not describe rotational movement around an axis. Thus, applicants assert that claims 5 and 22 are patentable.

Also, similar to the rejections made under 35 USC 102(b), applicants reiterate the assertion that each of dependant claims 6-21 each claim depends from claim 5 in the chain of dependency and thus include the limitations of the apparatus of claim 5. Therefore, claims 6-21 are patentable because Wang does not teach all of the limitations of claim 5 as described above.

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CONCLUSION

For these reasons, Applicants believe all pending claims are now in condition for allowance. If the Examiner has any questions pertaining to this application or feels that a telephone conference would in any way expedite the prosecution of the application, please do not hesitate to call the undersigned at (781) 280-1522.

The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account 01-0431.

Applicants respectfully request that a timely Notice of Allowance be issued in this case.

Respectfully submitted,

By 

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